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French Patent, granted to I. F. Body, for making Glue from materials not before used for that purpose.

Description of the Process.

The bones of every species of animal may be used to form the base of this glue; and they are reduced to a fine powder in cast-iron mortars. This powder is put into a copper boiler, placed in a furnace of brick-work, carried up to the top of the boiler, the base of which stands on a thin bed of the same. The boiler is filled with the powder to within six inches of the top; then river water is poured in until it covers the powder about two inches. A fire is then to be lighted under the bed of brick-work; the heat of which will soon be communicated to the boiler, and cause the mixture to boil without the risk of its adhering to the bottom, which could not be avoided if the flame was carried directly to the bottom of the boiler. When the mixture has boiled for twelve hours successively, the fire is discontinued; and, by means of a crane or otherwise, the boiler is raised above the furnace, and placed on a platform of brick-work, where it remains for four hours, for the mixture to deposit. This is a sufficient time for the liquor to cool and become clarified; then, by means of a pump, the liquor on the top is extracted from the powder, which has sunk to the bottom. This operation done, the boiler containing the powder is replaced in the furnace, filled with fresh water, and made to boil again for twelve hours. The liquor before extracted from the boiler is poured into wide and shallow copper pans, which are lodged in brick furnaces, made to fit them, and with a moderate fire the liquor thickens by evaporation.

The great boiler having boiled the second time, the fire is entirely discontinued, and the mixture is immediately poured into strong cloth bags, and tied up; it is then pressed, in order to extract all the liquor, which falls into shallow tubs, by spouts, that are disposed about the press. The liquor is added to that of the first boiling, which is in the copper pans, and the earthy part that remains in the bags after the operation, is thrown away as useless.

The evaporation of the liquor in the pans is continued by a small fire, which is diminished by degrees.

Lastly; when the liquor has acquired the consistence of a thick syrup it is run into tin moulds, where it remains until quite cold.

To take the glue out of the moulds they are beaten on the four sides, which are jointed; and with knives made on purpose, the square mass is divided into cakes, of two or three lines in thickness. They are then exposed upon strings to a current of air.

They are twelve days in summer and three weeks in winter in becoming perfectly dry.

Process for making very fine Flint Glass; by M. Cazalet, of Bourdeaux.

(From the Annales des Arts, &c.)

M. Cazalet puts into a platina crucible, containing twelve ounces of flint glass, 100 parts of pure minium, previously strained through a silk sieve, 50 parts of purified nitre, one part of very pure and very white lime, and 60 parts of very white sand, calcined and pounded in an iron mortar, afterwards washed by ebullition with sulphuric acid, and still farther purified with muriatic acid.

This mixture, exposed in a bottle-glass house furnace, becomes very liquid. At the end of thirty-six hours it is poured into pure water, in order to be reduced to a fine powder. It must then be washed and purified in the same manner as the sand, re-melted as before, again thrown into water, pulverised and purified with the acids, then again melted, and at the end of forty-eight hours taken out of the crucible, and run upon a plate of copper very hot, on which it is left to cool by insensible degrees.

By this method a very white glass is obtained, which is always free from fibres, spots, &c., and possesses all the qualities requsite for objective glasses.

If pure materials be used, and if the crucible while it remains in the fire be always covered with its cover of the same metal, the oxyds of manganese and arsenic are not necessary.

Specification of a patent granted to James Thomson, of Primrose Hill, near Clithero, in the County of Lancaster, Calico printer; for a method of producing patterns on Cloth, previously dyed Turkey Red, and made of Cotton or Linen, or both.

Dated, March 3, 1813.

First, Mix or combine with the acid

called oxymuriatic acid (or dephlogisticated acid of sea salt,) and water, some of the alkaline salts or earths hereinafter named, which shall weaken or suspend the power of the said acid in such proportion that it shall not, in such mixed or combined state, of itself, and without any farther operation, be able to remove the Turkey red colour from the cloth, or materially to impair it, within the moderate space of time taken up in the performance of the process hereinafter described.

Secondly, Print, stamp, pencil, or otherwise apply to those parts of the said cloth which are intended to be either wholly or in a greater or less degree deprived of their red colour, some other acid or metallic oxyd, or calx, which has a greater affinity or attraction for the alkaline salt or earth with which the oxymuriatic acid is mixed or combined, than that acid itself possesses; and if any one of the stronger or more powerful acids be employed, which is either of a corrosive nature, and cannot be safely used, or of a volatile nature, and cannot be used conveniently, such acids must be combined with alkalies, earths, metals, or metallic oxyds or calces, so as to form neutral salts, acid salts, or metallic salts, which shall not be too corrosive or too volatile, and such alkalies, earths, metals, or metallic oxyds, or calces only, must be employed, as have a weaker affinity or attraction for the same acid, than that acid has for the alkaline salt or earth with which the oxymuriatic acid has been mixed or combined.

Thirdly, After the said acids, oxyds, neutral salts, acid salts, or metallic salts, so directed to be printed, stamped, pencilled, or otherwise applied to the cloth as aforesaid, have been so printed, stamped, pencilled, or otherwise applied to the cloth as aforesaid, and are sufficiently dry, immerse the cloth in the solution of the said oxymuriatic acid, so mixed or combined with some of the alkaline salts or earths hereinafter named as aforesaid. When the acid or oxyd which either in its simple or combined state has been applied to parts of the cloth, immediately seizes upon and combines with the alkaline salt or earth with which the oxymuriatic acid has been mixed or combined, and disengages that acid, which almost instantaneously deprives of their colour those parts of the cloth to which the said acids or oxyds which, in their simple or combined state, have been so printed, stamped, pencilled, or otherwise applied as aforesaid, have been so applied.

Lastly, Wash or otherwise remove all the said acids, oxyds, or salts, by the usual processes. For the more fully explaining and illustrating the invention hereinbefore described, I add the following remarks. The alkaline salts or earths which I mix or combine with the oxymuriatic acid, in order to suspend or prevent its action on those parts of the red cloth which are intended to retain their colour, are the alkaline salts of potash and soda, or the calcareous, magnesian, barytic, or strontitic earths, of which I prefer the calcareous earth.

The acids which I apply to the parts intended to be made white, or to those places on the cloth intended to be deprived of their red colour, in a greater or less degree, are any of the vegetable, mineral, or animal acids, which have a stronger attraction for the alkaline salt or earth with which the oxymuriatic acid has been mixed or combined, than that acid itself has; such, for instance, are the citric, oxalic, tartaric, malic, benzoic, sulphuric, sulphurous, phosphoric, fluoric, boracic, nitric, muriatic, arsenic, tungstic, succinc, and carbonic acids.

The stronger acids, or such as might corrode the cloth, I saturate more or less with some alkaline salt, earth, or metallic oxyd or calx, for which they have a weaker affinity or attraction than they have for the alkali or earth with which I have combined the oxymuriatic acid; for instance, I unite the sulphuric acid with pot-ash, so as to form the acid sulphate of potash, (or acid vitriolated tartar,) or with aluminous earth, to form alum. The muriatic acid I combine with tin, or copper, or zinc, forming muriate of tin, muriate of copper, or muriate of zinc. In like manner, the nitric acid may be combined with the aluminous earth, or with the volatile alkali, or with the metals, or oxyds of copper, or zinc, or iron, or mercury; and I take care, when I use acidulous compounds of such corrosive acids, not to suffer the acid so far to predominate, as to render the compound injurious. In like manner, I combine the volatile acids, or such as might evaporate too speedily, with some alkaline salt, or earth, or metallic oxyd or calx, for which they have a weaker affinity or attraction than they have for the alkali or earth with which I have combined the oxymuriatic acid; for instance, I combine the acetic acid with the earth of alum, so as to form acetate of alumine; or with copper, forming acetate of copper; or with zinc, forming acetate of zinc. The carbonic acid may be fixed and combined with an alkali, as with soda, for example, forming carbonate of soda, which may be used though with less advantage than the preceding combinations. Those acids which are not corrosive nor volatile, and which consequently are used with most advantage in their simple or combined state, may, however, be united like the preceding to the alkalies, earths, metals, or metallic oxyds or calces, for which they have a weaker affinity or attraction than they have for the alkali or earth with which the oxymuriatic acid has been united: thus, the tartaric acid may be combined with potash, to form cream of tartar, and the oxalic acid with potash to form salt of sorrel, and these two salts may be employed in the process, though it is not necessary so to combine the two acids, but on the contrary, the acids may be used alone.

The combinations which I prefer as uniting the greatest number of advantages upon the whole, are, the super sulphate of potash, (or acid vitriolated tartar,) the sulphate of copper or blue vitriol, the muriate of tin or sal jovis, the nitrate of copper, and the muriate of copper. But I prefer to any single combination, a mixture of the super sulphate of potash with the tartaric or citric acids.

Lastly, I employ, uncombined, such metallic oxyds or cakes, as approach in their properties to the nature of acids, and are capable of combining either with the alkaline salts of potash or soda, or with the calcareous, magnesian, or strontitic earths, or of disengaging them, or any of them, from their combination with oxymuriatic acid; such, for instance, is the oxyd of arsenic, or common white arsenic, and the oxyds of tin and tungsten.

It is evident, from what I have set forth in the preceding part of this specification, that this process admits of great variety in its application, according to the combinations I make use of; since not only the various acids, oxyds, and salts, I have enumerated, may be employed, but also various mixtures of them, and in various proportions; but I prefer, and generally use the following process.

First, I take one gallon of good vinegar, or rectfied pyroligneous acid, which I thicken with starch or flour, in the way practised by calico printers, in preparing the mordants or colours for printing. Whilst boiling hot, I add to it five pounds of crystallised tartaric acid, and incorporate the whole very well by stirring.

Or, I take one gallon of strong concentrated lime-juice, or lemon-juice, or one gallon of water, in which I have dissolved two pounds and a half of crystallised citric acid, which I thicken with starch or flour in the manner directed above, and to which, whilst hot, I add two pounds of super sulphate of potash, and incorporate the whole very well by stirring. I prefer starch to any other thickening, though others may be used with more or less advantage.

Secondly, The paste so prepared I print, stamp, pencil, or otherwise apply to the cloth previously dyed Turkey red, in the mode, and with the precautions generally used in the printing or stamping of linens or cottons.

Thirdly, I prepare a solution of oxymuriate of lime, either by dissolving the dry oxymuriate of lime (commonly called bleaching powder or bleaching salts,) in water, or by passing the oxymuriatic acid gas into a vat, vessel, or cistern, in which, by agitation or otherwise, I keep suspended such quantity of quick lime, as will more than saturate fully and completely the said oxymuriatic acid gas. In either way, I obtain a solution of oxymuriate of lime with excess of lime. That which I use and prefer is of the specific gravity 1050, and I seldom employ it lower than 1030, (water being considered as 1000.) The vat, vessel, or cistern, which contains the solution of oxymuriate of lime, in which I immerse the cloths, may be of any size or form best adapted to the purpose or situation. I use and prefer vessels of stone, of from six to eight feet deep, six to seven feet long, and three and a half to four feet broad, but larger or smaller vessels will answer very well.

Fourthly, When the cloths are ready for immersion, which they are as soon as the paste is dry, I hook them on a frame, such as is used in dying indigo or china blues, commonly called a dipping frame, on which the cloth should be so disposed that no two folds can touch each other. I then plunge the frame with the cloth so attached into the vat, containing the solution of oxymuriate of lime, and keep it gently in motion during the time of the immersion, which should not be prolonged more than ten minutes, and which rarely need exceed five minutes. The object being either wholly or partially to remove the Turkey red dye from certain parts or places. As soon as that is done the cloth should be withdrawn from the solution of the oxymuriate of lime, and plunged or rinsed in clean water. I practise and approve the aforesaid plan of immersion, but any other plan or plans by which the cloth can be exposed a greater or less time to the action of the oxymuriate of lime, without bringing one part of the said cloth into contact with another, will answer very well.

Lastly, After having as before directed, rinsed or washed the cloths in clean water, I free them from all remains of the different agents or substances employed, by the ordinary means of washing, branning, or soaping, as practised by calico printers; and if those parts of the cloth that are intended to be made white, should still retain any red or other tinge or stain injurious to the effect, in order to render the white complete, I clear it by the usual process of exposure to the air, or by passing the cloth through hot water, to which I have added as much of the solution of oxymuriate of lime as will remove the said stains or tinge, without material injury to those parts from which the red dye is not intended to be removed.

I then proceed, if other colours are to be applied to finish the cloths, by the ordinary and well-known methods of calico printers; but these not being necessarily connected with nor forming any part of the peculiar process or invention herein intended to be described, I purposely make no mention of here.

The above particulars and examples are given for the more full explanation of the said invention, and the manner in which the same is to be performed. But the invention whereof I claim the sole and exclusive use consists in printing, stamping, penciling, or otherwise applying to those parts of the cloth which are intended to be either wholly, or in a greater or less degree deprived of their red colour, an acid, oxyd, neutral salt, acid salt, or metallic salt, such as is hereinbefore for that purpose directed, and immersing the whole cloth in such mixture or combination of oxymuriate acid and water, with some of the alkaline salts or earths, as is herein directed for that purpose.

On the laying out of Roads; by R. L. Edgeworth, Esq.

(From an Essay on the construction of Roads and Carriages.)

The roads of Britain were probably made at very remote periods, from the immediate necessity of communication between the places to which they lead. Before carriages of burden were in use, little more was required than a path upon hard ground, that would bear horses. All marshy grounds were therefore shunned; the fords of rivers were resorted to, and the inequality or circuit of the road was of much less consequence, than when carriages, instead of pack-horses, began to be employed.

When carriages were first employed, they probably were light and narrow, and did not require to have roads of any considerable breadth or firmness. And when roads had once been thus traced, indolence and habit prevented any great exertions to lay them out in better lines, or to repair them in any manner beyond what present convenience absolutely required. When heavier carriages and greater traffic made wider and stronger roads necessary, the ancient track was pursued; ignorance and want of concert in the proprietors of the ground, and, above all, the want of some general effective superintending power, continued this wretched practice, till turnpikes were established. This salutary measure created a new and far better system of roads, and the obvious utility and apparent justice of this tax might have ensured the acquiescence of the public; but so blind are the people in general to their real interests, that to whatever is new and whatever immediately requires their money, they are commonly averse. In many places, the first turnpikes were torn down, and military force was necessarily called on to compel the country people to have practicable roads for their own convenience and emolument. The introduction of turnpikes turned the attention of gentlemen to the improvement of cross-roads; but for many years, in most places, and in some to this very day, the cross-roads of England continue in a wretched state of repair.

The system of following the ancient line of road has been so pertinaciously adhered to, that roads have been sunk many feet, and in some parts many yards below the surface of the adjacent ground; so